

CLAIMS

1. A method of transferring signals from a plurality of individual sensing elements provided on a first integrated circuit to a processing means provided on a second integrated circuit comprising the steps of sequentially sampling
5 the output of a number of sensing elements in a predetermined sequence to create a first signal, modulating the amplitude of a constant frequency signal to create a second signal, transmitting said second signal from said first integrated circuit to said second integrated circuit, demodulating said second signal to regenerate said first signal and passing said regenerated first signal
10 to said processing means.
2. A method according to Claim 1 wherein the outputs of a first group of individual sensing elements are sampled and are then used to modulate a carrier signal of constant known frequency and, the output of a second group of individual sensing elements is simultaneously sampled and used to
15 modulate a carrier signal of a different constant known frequency, both modulated signals being simultaneously transmitted to said second integrated circuit and simultaneously demodulated after arriving at said second integrated circuit.
3. A method according to Claim 2 wherein outputs of several such groups
20 of individual sensing elements are simultaneously sampled, modulated, transmitted and demodulated.
4. A method according to Claim 3 wherein the groups of sensing elements correspond to individual rows or columns in a sensing array, the sampling sequence within the group starting with a sensor at one end of the said row or
25 column and finishing with the sensor at the opposite end of said row or column.
5. A method according to Claim 4 wherein each row or column is provided with dedicated modulating means and the modulated signals are subsequently combined by a suitable combining means.

6. A method according to any preceding claim wherein the sampling process is repeated instantly.
7. A method according to any preceding Claim wherein there is a predetermined delay between the successive sampling sequences.
- 5 8. A method according to any preceding claim wherein said second signal undergoes analogue to digital conversion and is subsequently demodulated as a digital process.
9. A method according to Claim 8 wherein signals resulting from a digital demodulation process are stored in registers for further image processing.
- 10 10. A method according to any one of Claims 4 to 9 wherein each carrier signal for each row or column or group of the individual sensing elements has a different frequency.
11. A method according to Claim 10 wherein carrier frequencies are determined such that any odd harmonics that may be generated during the modulation process using one carrier frequency are at frequencies that do not fall close to other carrier frequencies.
- 15 12. A method according to Claim 11 wherein carrier frequencies are produced by integer division from a single clock frequency signal.
13. A method according to Claim 12 wherein a suitable clock frequency is 1 Megahertz and a suitable integer division ratios are one of 18, 20, 22, 25, 28, 33, 40 and 50.
- 20 14. A sensing device comprising an array of individual sensing elements provided on a first integrated circuit and processing means for the output of said array of said sensing elements provided on a second integrated circuit, said circuits being linked by a single conducting connection, said first integrated circuit comprising in addition to said sensing elements, sampling means for sequentially sampling the output of said sensing elements in a predetermined order to generate a first signal, signal generator means for
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generating a carrier signal of a constant known frequency, modulation means for modulating said carrier signal with said first signal to generate a second signal, and transmission means for transmitting said second signal to the second integrated circuit, said second integrated circuit incorporating means
5 for receiving said second signal, means for demodulating said second signal to regenerate said first signal and means for processing said regenerated first signal.

15. A sensing device according to Claim 14 wherein the outputs of a first group of individual sensing elements are sampled and are then used to
10 modulate a carrier signal of constant known frequency and, the output of a second group of individual sensing elements is simultaneously sampled and used to modulate a carrier signal of a different constant known frequency, both modulated signals being simultaneously transmitted to said second integrated circuit and simultaneously demodulated after arriving at said
15 second integrated circuit.

16. A sensing device according to Claim 14 or Claim 15 wherein outputs of several such groups of individual sensing elements are simultaneously sampled, modulated, transmitted and demodulated.

17. A sensing device according to Claim 16 wherein the groups of sensing
20 elements correspond to individual rows or columns in the sensing array, the sampling sequence within the group starting with the sensor at one end of the said row or column and finishing with the sensor at the opposite end of said row or column.

18. A sensing device according to Claim 17 wherein each row or column is
25 provided with dedicated modulating means and the modulated signals are subsequently combined by a suitable combining means.

19. A sensing device according to any one of Claims 14 to 18 wherein the sampling process is repeated instantly.

20. A sensing device according to any one of Claims 14 to 18 wherein there is a predetermined delay between the successive sampling sequences.
21. A sensing device according to any one of Claims 17 to 20 wherein each sensing element in a row or column is connected to a row or column
5 output conductor by a switch.
22. A sensing device according to any one of Claims 14 to 21 wherein sequential sampling of the outputs of individual sensing elements is carried out by sequentially connecting each sensing element to the row or column output conductor by closing each switch in turn.
- 10 23. A sensing device according to Claim 21 or Claim 22 in which each sensor generates a differential output, each said sensing element being connected by a pair of switches to a pair of output conductors, these switches being closed in turn.
24. A sensing device according to any one of Claims 14 to 23 wherein said
15 second signal undergoes analogue to digital conversion and is subsequently demodulated as a digital process.
25. A sensing device according to Claim 24 wherein signals resulting from a digital demodulation process are stored in registers for further image processing.
- 20 26. A sensing device according to Claim 24 or Claim 25 in which digital processing is carried out by a microprocessor.
27. A sensing device according to any one of Claims 17 to 26 wherein each carrier signal for each row or column or group of the individual sensing elements has a different frequency.
- 25 28. A sensing device according to Claim 27 wherein carrier frequencies are determined such that any odd harmonics that may be generated during the modulation process using one carrier frequency are at frequencies that do not fall close to other carrier frequencies.

29. A sensing device according to Claim 29 wherein carrier frequencies are produced by integer division from a single clock frequency signal.
30. A sensing device according to Claim 29 wherein a suitable clock frequency is 1 Megahertz and a suitable integer division ratios are one of 18,
5 20, 22, 25, 28, 33, 40 and 50.
31. A sensing device according to any one of claims 26 to 31 wherein a signal clock signal generator or synchronisation signal generator is connected to both integrated circuits.
32. A sensing device according to any preceding claim in which said
10 sensing elements are IR (infrared) sensing elements.